

Technical Datasheet



PolyGard®2

Compactcontroller MSC2-Compact

Gas detection system with remote sensors
for flammable, toxic and refrigerant gases

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Specifications subject to change without notice.
Up-to-date data sheets and user manuals can be found in the download area of www.msr-24.com.
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■ Made
■ in Germany

DESCRIPTION

The Compactcontroller is designed as a gas detection system for connection of max. 10 SB2Units (SB2 + Sensor-Cartridge) via its own field bus. The controller monitors the measured values and activates the alarm relays if the specified max. 4 alarm thresholds for pre- and main alarm are exceeded. The analog 4–20 mA output provides either a sum signal of all or certain measured values or the signal of one measured value.

The SIL2-compliant self-monitoring in the Compactcontroller as well as in the connected SB2Units activates the fault signal in the event of an internal fault as well as in the event of a fault in the field bus communication (SB2Unit) and in the event of a fault in the 4–20 mA output current signal.

Other options such as 3-colour status LEDs, buzzer, digital input for acknowledgment function ensure proper adaptation to the wide range of applications in gas detection technology. The Compactcontroller can be configured and parameterised without additional tool.

APPLICATION

The Compactcontroller is designed for detection and warning of gases in many commercial and industrial applications.

FEATURES

- Display for all display, configuration and calibration functions (no additional tool required)
- Fieldbus connection for up to 10 SB2 units with max. 900 m length
- Easy maintenance / calibration by replacing the sensor cartridge or via comfortable on-site calibration
- Hardware and software according to SIL-compliant development process
- Modular technology (plug-in and exchangeable)
- Reverse polarity protected, overload and short circuit proof
- Internal function monitoring with integrated hardware watchdog
- 3 relays with changeover contact, potential-free max. 250 V AC, 5 A
- 2 transistor outputs, 24 V DC, 0.1 A (plus switching)
- Various housing types with IP65
- 2 digital inputs
- Warning buzzer and status LED for alarm, fault, operation and service (option)
- Operating voltage 230 V AC, with wide range input 100–240 V AC (option)
- ANSI/UL 61010 1 & CAN/CSA-C22.2 No. 61010-1 (option)
- Conformity to:
 - EN 50271
 - IEC/EN 61508-1-3
 - EN 60079-29-1
 - EN 50104
 - EN 50545-1

SPECIFICATIONS COMPACTCONTROLLER¹

ELECTRICAL	
Power supply	24 V DC \pm 20 %, reverse polarity protected
Power consumption	
- Control Board	Max. 60 mA (1.5 VA), w/o SB2Unit, w/o WAO
- Per SB2Unit	Max. 70 mA (1.7 VA)
- Horn / warning light (WAO)	Max. 40 mA (1.0 VA)
Overvoltage category	I
Alarm relay (2)	250 V AC, 5 A, potential-free, change-over contact (SPDT)
Fault relay (1)	250 V AC, 5 A, potential-free, change-over contact (SPDT)
Transistor output (2)	24 V DC / 0.1 A (switching to plus)
Digital input (2)	24 V DCV, 10 mA (potential-free contact against GND)
	Proportional, overload and short-circuit proof, load \leq 500 Ω
	4–20 mA = range
	2.4–4 mA = underrange
	> 20–21,2 mA = overrange
	< 2.0 mA = fault
Outgoing line for field bus	24 V DC for max. 20 SB2Units., overload and short-circuit proof, reverse-polarity protected
Field bus for SB2Unit	RS-485 / 19200 Baud (max. cable length 900 m)
AMBIENT CONDITIONS	
Temperature range	-25 °C to +60 °C (-13 °F to +140 °F)
Humidity range	15–95 % RH non-condensing
Pollution degree	2 (indoor installation only), not suitable for wet environments
Temperature - storage	-20 °C to +65 °C (-40 °F to 149 °F)
Storage time	6 months
PHYSICAL	
Housing type C and E	Polycarbonate
Burning behaviour	UL 94 V2
Housing colour	RAL 7032 (light grey)
Dimensions housing (B x H x T)	Type C: 130 x 130 x 75 mm (5.11 x 5.11 x 2.95 in.) Type E: 130 x 130 x 99 mm (5.11 x 5.11 x 3.90 in.)
Weight	Max. 0.6 kg (1.32 lbs)
Protection class (delivery state*)	IP65
Installation	Wall mounting
Cable entry	Standard 6x M20/25
Connection type: Field bus (SB2Unit)	Pluggable screw-type terminals, 0,25–1,3 mm ²
Digital input. analog output	Pluggable screw-type terminals, 0,25–1,3 mm ²
Power supply, relays	Pluggable screw-type terminals, 0,25–2,5 mm ²
LC-DISPLAY	
LCD	2 lines, 16 characters each, background highlighted in 2 colours
Operation	Menu driven via 6 pushbuttons
OPTIONS	
VISUAL / AUDIBLE INDICATOR	
Colour / mode	Red / yellow / green (alarm – fault – operation - service)
Acoustic pressure / frequency	> 85 dB (A) (distance 0.1 m) / 2300 Hz \pm 300 Hz
POWER SUPPLY 100–240 VAC	
Wide range input	100–240 V AC - 50/60 Hz
Output rating type 7	15 VA

SPECIFICATIONS SB2UNIT¹

ELECTRICAL	
Power supply	24 V DC \pm 20 %, reverse-polarity protected
Power consumption (24 V DC) w/o SC2	10 mA (0.24 VA)
Overvoltage category	I
Output for local bus	5 V DC, 250 mA max. Overload, short-circuit and reverse-polarity protected
SERIAL INTERFACE	
Local bus	1-wire / 19200 Baud
Field bus	RS-485 / 19200 Baud (max. cable length 900 m)
Tool bus	2-wire / 19200 Baud
AMBIENT CONDITIONS	
Temperature range	-35 °C to +60 °C (-31 °F to 140 °F) Pay attention to the temperature range of the SC2 used
Humidity range	15–90 % RH not-condensing
Pollution degree	2 (installation only indoors), not suitable for wet environment
Permissible height above sea level	1500 m (ca. 5000 ft.)
Storage temperature	-20 °C to +65 °C (-40 °F to 149 °F)
Storage time	6 months
PHYSICAL	
Housing type A	Polycarbonate
Burning behaviour	UL 94 V2
Housing colour	RAL 7032 (light grey)
Dimensions W x B x D	94 x 130 x 57 mm (3.7 x 5.1 x 2.2 in.)
Weight	0.3 kg (0.7 lb)
Protection class (delivery status)*	IP65
Installation	Wall mounting
Wire connection: Field bus	Pluggable screw-type terminal 0.25–2.5 mm ² (24 to 10 AWG)
Local bus for SC2	3-pin connector
Knockout for integration of sensor	3x M25 for M25 housing
REGULATIONS	
Directives	EMC directives 2014/30/EU Low Voltage Directive 2014/35/EU CE EN 61010-1:2010 Conformity to: EN 50271 IEC/EN 61508-1-3 EN 60079-29-1 EN 50104 EN 50545-1 ANSI/UL 61010-1 CAN/CSA-C22.2 No. 61010-1
Warranty	1 year on sensor (not if poisoned or overloaded) 2 years on device

* If there are changes to the housing it has to be re-evaluated.

¹ For the specifications of the SC2, please refer to the corresponding data sheets.

All specifications were collected under optimal test conditions.

We confirm compliance with the minimum requirements of the applicable standard.

SHORT DESCRIPTION OF THE FUNCTIONS: DIGITAL OUTPUTS WITH 3 RELAYS

Action	Reaction Relay 1 (Alarm1)	Reaction Relay 2 (Alarm2)	Reaction Warning light	Reaction Horn (Alarm 2)	Reaction Relay 3 (collective fault)
Sensor signal < alarm threshold 1	OFF	OFF	GREEN	OFF	OFF
Sensor signal > alarm threshold 1	ON	OFF	RED slowly flashing	OFF	OFF
Sensor signal > alarm threshold 2	ON	ON	RED fast flashing	ON	OFF
Sensor signal ≥ alarm threshold 2, but button Horn OFF activated	ON	ON	RED fast flashing	OFF after delay ON	OFF
Measuring signal < (alarm threshold 2 - hysteresis) but ≥ alarm threshold 1	ON	OFF	RED slowly flashing	OFF	OFF
No alarm, no fault	OFF	OFF	GREEN	OFF	OFF
No fault, but maintenance due	OFF	OFF	GREEN flashing	OFF	OFF
Internal error	OFF	OFF	YELLOW	OFF	ON

Note Relays 1 & 2:

Status **OFF** means: "Alarm Off" = relay coil energized

Status **ON** means: "Alarm On" = relay coil de-energized

Note Relay 3:

Status **OFF** means: " No fault and MSC2 in operation" = relay coil energised

Status **ON** means: " Fault or MSC2 de-energized" = relay coil de-energized

Note 3: Alarm thresholds can have the same value, therefore the relays and/or horn and warning light can be controlled together.

ORDERING INFORMATION: Compactcontroller

MSC2 -	X-	X	3	X	3	2	0	2	0	X	
											C Compactcontroller Version UL/CSA 61010-1
											K Compactcontroller w/o further options Further options
									0		Not used
								2			With display / keypad Display
								0			Not used
							2				2x digital input Digital input
							3				Analog output Output signal 4-20 mA
							0				Without visual/audible indicator
							4				Buzzer & status-LED (red, yellow, green) Visual/audible indicator (WAO)
							3				3x relay Relay
							2				24 V DC
							7				100–240 V AC / 24 V DC, 15 VA (only with housing type E) Power Supply
							C				Housing type C 130 x 130 x 75 mm
							E				Housing type E 130 x 130 x 99 mm Housing

* Only on request

EXAMPLE

Compactcontroller with 24 V DC, 3 relays, w/o WAO, analog output, 2 digital inputs, with display and keypad, no option

Order number: MSC2-C-23032020K

ORDERING INFORMATION: SB2Unit (Sensor Board + Sensor Cartridge)

SB2U-	A-	E11XX-XX	Electrochemical sensors for toxic gases	See
		P34XX-X	Pellistor sensor for combustible gases	DB_SC2_Tox
		S20XX-XX-A	Semiconductor sensors for Freon gases	DB_SC2_Ex
		S21XX-X	Semiconductor sensors for toxic gases	DB_SC2_Freon
		I-SXXXX-X	Infrared sensors for CO ₂	DB_SC2_HL
		S4XX-X	Infrared sensors for combustible gases	DB_SC2_IR
		I4XX-X	Premium Infrared sensors for CO ₂ and combustible gases	DB_SC2_IR_Pr.
	Preferred types with pre-parameterisation			
		Gas type	Measuring range	Sensor type
	E1110-FX	Carbon monoxide, CO	0–300 ppm	Electrochemical
	E1130-CX	Nitrogen dioxide, NO ₂	0–30 ppm	Electrochemical
	E1183-BX	Hydrogen cyanide, HCN	0–50 ppm	Electrochemical
	E1190-AX	Ozone, O ₃	0–5 ppm	Electrochemical
	E1195-A2	Oxygen, O ₂	0–25 % vol	Electrochemical
	P3400-A	Methane, CH ₄	0–100 % LEL	Pellistor
	S2077-01-A	R134a	0–2000 ppm	Semiconductor
	I-S1164-B	Carbon dioxide, CO ₂	0–5 % vol	Infrared
A Housing type A 94 x 130 x 57 mm (version UL/CSA 61010-1)				Housing

The technical data of the sensor cartridge and other gas types can be found in the respective data sheets, DB_SC2_XXX.

Other gases on request

EXAMPLE

SB2Unit preconfigured for SC2 carbon monoxide, measuring range 0–300 ppm, mounted in plastic housing (type A), version UL/CSA 61010-1

Order number: SB2U-A-E1110-F

ACCESSORY

Duct mounting set

Order number: C2-Z2

Calibration adapter

Order number: C2-Z4

Splash protection cap SplashGuard

Order number: C2-Z5

ELECTRICAL CONNECTION

